

Serial No. 09/484,316
Response dated November 17, 2003
Reply to Office Action of 08/15/03

Docket No. 5000-4723

IN THE CLAIMS

Please amend claims 1, 2-6, 8, 10-12, 16, and 19 as follows:

1. (Currently Amended) An apparatus for aiding steering when a vehicle is being driven in reverse, the moving direction of the vehicle being determined in response to the position of steered wheels, the apparatus comprising:

a camera for capturing an image of an area behind the vehicle;

a monitor for displaying the image captured by the camera; and

a display control unit for displaying a guide marking for aiding steering,

the marking and the image being simultaneously displayed on the monitor when the vehicle is being driven in reverse, wherein the marking provides a driver with at least first and second indications indication, the first indication which is fixedly displayed on the monitor so as to display behind the vehicle concerning [[of]] the width of the vehicle and the [[a]] second indication of a prospective path of the vehicle corresponding to the angle position of the steered wheels.

2. (Currently Amended) The apparatus as recited in claim 1, wherein the vehicle has a detector for detecting the position angle of the steered wheels, wherein the display control unit calculates the prospective path assuming that the vehicle is moved in reverse, on the basis of information from the detector, and wherein the second indication of the marking is displayed according to the width of the vehicle, and at least one mark is displayed to appear to be a predetermined distance behind the rear end of the vehicle on the prospective path.

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3. (Currently Amended) The apparatus as recited in claim 2, wherein the second indication of the marking includes an indication of a space that is as side as the vehicle in appearance, the space being located behind the vehicle in the image.

4. (Currently Amended) The apparatus as recited in claim 2, wherein ~~at least one of the second indication of the marking includes an indication defined by two points that are spaced apart approximately by the width of the vehicle in appearance.~~

5. (Currently Amended) The apparatus as recited in claim 2, wherein the second indication of the marking includes an end mark that approximately indicates the width of the vehicle in appearance at an apparent predetermined distance behind the rear end of the vehicle on the prospective path and side marks extending from the end mark toward the rear end of the vehicle, wherein the side marks are spaced apart approximately by the apparent width of the vehicle.

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6. (Currently Amended) The apparatus as recited in claim 5, wherein the second indication of the marking further includes two intermediate marks appearing between the end mark and the rear end of the vehicle, each intermediate mark extending between the side marks, wherein the intermediate marks indicate the apparent width of the vehicle.

7. (Original) The apparatus as recited in claim 2, wherein the predetermined distance appears to be approximately the same as the wheel base of the vehicle.

8. (Currently Amended) The apparatus as recited in claim 5, wherein the display control unit calculates the prospective path using polar coordinates and wherein the end of the second indication of the mark is determined by a radial line extending from the polar coordinates.

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9. (Original) The apparatus as recited in claim 2, wherein, when the prospective path is circular, the display control unit displays the path in an elliptical manner by compressing the prospective path in the longitudinal direction of the vehicle at a predetermined rate.

10. (Currently Amended) The apparatus as recited in claim 2, wherein the display control unit shifts the indication of the prospective path in the direction of vehicle movement on the monitor.

11. (Currently Amended) The apparatus as recited in claim 2, wherein the display control unit has an acquisition means for determining the steering speed, and wherein the display control unit calculates the prospective path using the current angle position of the steered wheels and a value obtained by multiplying the steering speed by a predetermined coefficient.
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12. (Currently Amended) The apparatus as recited in claim 2, wherein the vehicle has vehicle speed sensor for detecting the speed of the vehicle, and the display control unit has an acquisition means for determining the steering speed, and wherein the display control unit calculates the prospective path using the current angle position of the steered wheels and a value obtained by multiplying the ratio of the steering speed and the vehicle speed by a predetermined coefficient.

13. (Original) The apparatus as recited in claim 1, wherein the image is displayed in black and white and the indicia are displayed in color.

14. (Original) An apparatus for aiding steering when a vehicle is being driven in reverse, the moving direction of the vehicle being determined in response to the position of steered wheels, the apparatus comprising:

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a camera for capturing an image of an area behind the vehicle;
a monitor for displaying the image captured by the camera; and
a display control unit for displaying a guide marking that is fixed at a
predetermined position with respect to the monitor screen for aiding a driver in parking, the
control unit displaying the guide marking and the image simultaneously on the monitor when the
vehicle moves in reverse, wherein the parallel parking is completed by causing the marking to
coincide with a target point in the image, followed by backing while keeping the steered wheels
turned at their maximum angle.

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15. (Original) The apparatus as recited in claim 14, wherein the fixed marking
includes a pair of side marks that are spaced apart approximately by the apparent width of the
vehicle and a fixed end mark formed by connecting ends of the side marks on the screen, and
wherein the fixed guide marking includes a center mark positioned at the center of the fixed
guide marking.

16. (Currently Amended) The apparatus as recited in claim 14, wherein the
display fixed marking includes a first marking used when performing parallel parking to the left
and a second marking used when performing parallel parking to the right.

17. (Original) The apparatus as recited in claim 16, wherein the first marking and
the second marking are selectively displayed depending on whether the vehicle is to be parked to
the left or to the right.

18. (Original) The apparatus as recited in claim 14, wherein the vehicle has
obstruction detectors for detecting an obstruction existing near the front corners of the vehicle,

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and wherein the display control unit displays the presence of the obstruction on the monitor screen on the basis of a signal output from the obstruction detectors.

19. (Currently Amended) A method for aiding steering when a vehicle is driven in reverse, comprising:

displaying an image captured by a camera on a monitor provided at a driver's seat, wherein the image is of an area behind the vehicle;

superposing and displaying a guide marking for aiding steering upon the image, wherein the guide marking provides a driver with a first indication of the width of the vehicle and a second indication of a prospective path of the vehicle, the prospective path depends on the angle position of the steered wheels; and

causing the vehicle to proceed on a route when the vehicle is driven so that the guide display is positioned at a center of the route, the route being an image of a way behind the vehicle actually displayed on the monitor.